WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a semiconductor substrate;

source/drain regions formed in the semiconductor substrate;

a gate insulating film formed on a channel region between the source/drain regions;

a gate electrode formed on the gate insulating film; and

a sidewall insulating film formed on a sidewall surface of the gate electrode,

wherein the gate electrode is made of SiGe,

the sidewall insulating film is an insulating film obtained by oxidizing the sidewall surface of the gate electrode, and

the sidewall insulating film contains silicon oxide as a main component.

2. The semiconductor device according to claim 1, wherein a composition ratio of Ge/Si of the sidewall insulating film is lower than a composition ratio of Ge/Si of the gate electrode.

3. A semiconductor device comprising:

a semiconductor substrate in which a SiGe monocrystal layer is formed;

source/drain regions formed in the semiconductor substrate;

a gate insulating film formed on a channel region

between the source/drain regions; and

a gate electrode formed on the gate insulating film,

wherein the channel region is formed of the SiGe monocrystal layer,

the gate insulating film is an insulating film obtained by oxidizing a surface of the SiGe monocrystal layer, and

the gate insulating film is made of silicon oxide as a main component.

4. The semiconductor device according to claim 3, wherein a composition ratio of Ge/Si of the gate insulating film is lower than a composition ratio of Ge/Si of the SiGe monocrystal layer.

5. A method of manufacturing a semiconductor device, comprising:

forming an insulating film on a semiconductor substrate;

forming a conductive film made of a first semiconductor and a second semiconductor on the insulating film; and

thermal-oxidizing the conductive film in an atmosphere that contains an oxidant for oxidizing the first semiconductor and the second semiconductor and a reductant for reducing the first semiconductor and the second semiconductor, to form an oxide film made of the first semiconductor on the conductive film.

6. The method of manufacturing a semiconductor device, according to claim 5, wherein the first semiconductor and the second semiconductor are made of different ones of C, Si and Ge.

7. The method of manufacturing a semiconductor device, according to claim 5, wherein the first semiconductor is made of Si and the second semiconductor is made of Ge.

8. The method of manufacturing a semiconductor device, according to claim 7, wherein the oxidant for oxidizing Si is H_2O, the reductant for reducing Ge is H_2, a temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO_2 and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO_2 within a range of a partial pressure ratio (P_{H2O}/P_{H2}) of H_2O to H_2 in 10^{-1} to 10^{-21}.

9. The method of manufacturing a semiconductor device, according to claim 7, wherein the oxidant for oxidizing Si is at least one of H_2O, CO_2, and O_2, and the reductant for reducing Ge is at least one of H_2 and CO.

10. A method of manufacturing a semiconductor device comprising:

forming source/drain regions formed in a

semiconductor substrate;

forming a gate insulating film on a channel region between the source/drain regions;

forming a gate electrode made of SiGe on the gate insulating film; and

thermal-oxidizing the gate electrode in an atmosphere that contains an oxidant for oxidizing Si and a reductant for reducing Ge to form a sidewall insulating film on a sidewall surface of the gate electrode.

11. The method of manufacturing a semiconductor device, according to claim 10, wherein the oxidant for oxidizing Si is H_2O, the reductant for reducing Ge is H_2, a temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO_2 and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO_2 within a range of a partial pressure ratio (P_{H2O}/P_{H2}) of H_2O to H_2 in 10^{-1} to 10^{-21}.

12. The method of manufacturing a semiconductor device, according to claim 10, wherein the oxidant for oxidizing Si is at least one of H_2O, CO_2, and O_2, and the reductant for reducing Ge is at least one of H_2 and CO.

13. A method of manufacturing a semiconductor

device, comprising:

forming a monocrystal layer made of at least two kinds of semiconductors on a semiconductor substrate; and

thermal-oxidizing the monocrystal layer in an atmosphere that contains an oxidant and a reductant as an oxidation seed to form an oxide film made of one of said at least two kinds of semiconductors on a surface of the monocrystal layer.

14. The method of manufacturing a semiconductor device, according to claim 13, wherein said at least two kinds of semiconductors are made of different ones of C, Si and Ge.

15. The method of manufacturing a semiconductor device, according to claim 14, wherein the oxidant for oxidizing Si is H_2O, the reductant for reducing Ge is H_2, the temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO_2 and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO_2 within a range of a partial pressure ratio (P_{H2O}/P_{H2}) of H_2O to H_2 in 10^{-1} to 10^{-21}.

16. The method of manufacturing a semiconductor device, according to claim 13, wherein the oxidant is at least one of H_2O, CO_2, and O_2, and the reductant is

at least one of H_2 and CO.

17. A method of manufacturing a semiconductor device comprising:

forming an SiGe monocrystal layer including a channel region on a semiconductor substrate;

forming source/drain regions in the SiGe monocrystal layer formed on the semiconductor substrate;

forming a gate insulating film on the channel region between the source/drain regions; and

forming a gate electrode on the gate insulating film,

wherein the gate insulating film is formed on a surface of the SiGe monocrystal layer by thermal-oxidizing the SiGe monocrystal layer in an atmosphere that contains an oxidant for oxidizing Si, and

a reductant for reducing Ge, and the gate insulating film is made of substantially silicon oxide.

18. The method of manufacturing a semiconductor device, according to claim 17, wherein the oxidant for oxidizing Si is H_2O, the reductant for reducing Ge is H_2, a temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO_2 and a characteristic curve of equilibrium vapor-hydrogen partial pressure

characteristics of SiO_2 within a range of a partial pressure ratio (P_{H2O}/P_{H2}) of H_2O to H_2 in 10^{-1} to 10^{-21}.

19. The method of manufacturing a semiconductor device, according to claim 17, wherein the oxidant for oxidizing Si is at least one of H_2O, CO_2, and O_2, and the reductant for reducing Ge is at least one of H_2 and CO.

20. A method of manufacturing a semiconductor device, comprising:

forming a conductive film made of a first semiconductor and a second semiconductor on an insulating film formed on a semiconductor substrate; and

thermal-oxidizing the conductive film in an atmosphere in which the first semiconductor is oxidized and the second semiconductor is not oxidized, to form an oxide film made of the first semiconductor on the conductive film.